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Agricultural Memorandum No 774

Sugar Beet Yields - Weighted Weather Factors

L P Smith

The weather data was weighted with respect to the average of sugar beet in the vicinity of the sample stations, namely:-

Felixstowe 33, Cranwell 20, York 6, Ross 8, Mildenhall 33.

The resulting figures were analysed in regard to following variables:-

I_1 = improvement factor, years after 1950 maximum 10

I_2 = improvement factor, years after 1960.

ET = effective transpiration, July-September (wtd)

H = potential transpiration, August-September (wtd)

A_1 = April rainfall (wtd) deficit below 1 inch

A_2 = April rainfall (wtd), excess above 1.5 inches

RD = return to capacity date (wtd), 10 day units after Aug 25, maximum 10.

The final formula was

$$\text{Yield} = 0.34\, I_1 + 0.11\, I_2 + 0.74\, ET + 2.2\, H - 2.44\, A_1 - 1.17\, A_2 - 0.38\, RD - 1.26$$

with a mean error of 0.6 tons/acre and multiple correlation of 0.91. This is very little improvement on the simple mean of 5 stations.

Inclusion of percentages of virus yellows observed at end of August produced no further improvement. The A_1 term seems to include most of the disease effect, suggesting that losses are most significant if crops are retarded by early drought.

Any comments or suggestions on this paper should be referred to the author.

Meteorological Office
Bracknell

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